

What is claimed is:

1. A control valve of a variable displacement compressor that optionally varies displacement based on pressure in a crank chamber for adjusting the pressure in the crank chamber by varying an opening degree of a passage that interconnects the crank chamber and one of relatively high and low pressure regions of the refrigeration cycle, the control valve comprising:

a valve seat having a seat surface for adjusting the opening degree of the passage; and

a valve having a valve surface for adjusting the opening degree of the passage, at least one of the seat surface and the valve surface being made of a material with relatively high hardness.

2. The control valve according to claim 1, wherein both the seat surface of the valve seat and the valve surface of the valve are made of materials with relatively high hardness.

3. The control valve according to claim 1, wherein the seat surface and the valve surface are made of different materials from each other.

4. The control valve according to claim 1, wherein the material with relatively high hardness is formed by surface hardening that is selected from the group

consisting of nickel plating, nickel-phosphorus plating, nickel-boron plating, nickel-phosphorus-boron plating, nickel-boron-tungsten plating, chrome plating, copper plating, salt-bath nitriding, ion nitriding, gas nitrocarburizing and carburizing.

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5. The control valve according to claim 1, wherein an oil separator is arranged in the relatively high pressure region of the refrigeration cycle for separating lubricating oil from refrigerant gas that flows in the relatively high pressure region, the passage interconnecting the oil separator and the crank
10 chamber so as to double as a feeding passage for feeding the lubricating oil separated in the oil separator to the crank chamber.

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6. The control valve according to claim 1, wherein carbon dioxide is employed as refrigerant for the refrigeration cycle.

7. The control valve according to claim 1, wherein the material with relatively high hardness has Vickers hardness of 500 or above.

8. The control valve according to claim 7, wherein the material of the seat
20 surface has Vickers hardness of 500 to 800.

9. The control valve according to claim 7, wherein the material of the valve

surface has Vickers hardness of 900 to 1100.

10. The control valve according to claim 1, wherein maximum pressure difference between the relatively high and low pressure regions exceeds 10 MPa.